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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

SHERMAN, STEPHEN G

ART UNIT

PAPER NUMBER

2674

DATE MAILED: 02/08/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/662,398

Applicant(s)

BATHICHE, STEVEN N.

Examiner

Stephen G. Sherman

Art Unit

2674

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 4-7-05
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 3 and 9-10 are rejected under 35 U.S.C. 102(b) as being anticipated by Sellers (US 5,995,026).

Regarding claim 1, Sellers discloses a computer keyboard, comprising:

a frame (Figure 2, item 30.);

a plurality of keys located on the frame (Figures 1 and 2, items 28);

a force sensor coupled to the frame and configured such that at least a portion of a force applied by a user to a key of the plurality is transferred to the force sensor, the force sensor generating an output varying in relation to the magnitude of the user-applied force (Figure 2, item 44 and column 4, lines 56-61); and

a microprocessor (Figure 2, item 52) in electrical communication with the force sensor and configured, upon a user pressing a key of the plurality, to:

identify the pressed key (Column 5, lines 1-6. The examiner interprets that since the signal is sent from the key and that the microprocessor 52 can receive the signal

from the key that it can also determine what key is pressed, otherwise the keyboard would not function.),

receive force sensor output data generated by the key press (Column 5, lines 1-6), and

associate the received force sensor output data with the identified key (Column 5, lines 6-15. The examiner interprets that if the microprocessor can categorize the magnitude of the incoming signal from the key that it can associate the force with the key that was pressed.).

Regarding claim 3, Sellers discloses the computer keyboard of claim 1, wherein the microprocessor is configured to:

individually test each key of the plurality to detect if said key is pressed by a user, and only receive force sensor output data when a key press has been detected (Figure 2 and column 5, lines 1-15. The examiner interprets that allowing no signal to be received at the microprocessor end when the switches are open, i.e. no key has been pressed, is the microprocessor testing the keys individually via the leads 48 and that when a key is pressed and only when a key is pressed is when the microprocessor receives the force signal from the selected key.).

Regarding claim 9, Sellers discloses the computer keyboard of claim 1, further comprising a plurality of force sensors (Figure 2, items 44).

Regarding claim 10, Sellers discloses the computer keyboard of claim 1, wherein the microprocessor is configured to:

detect simultaneous presses of multiple keys and identify the keys pressed receive force sensor output data resulting from the simultaneous key presses, (Figure 2 and column 5, lines 1-15. The examiner interprets that since each force sensor has its own lead 48 that the microprocessor is able to receive/detect multiple simultaneous key presses.), and

apportion among the multiple pressed keys a total force represented by the force sensor output data resulting from the simultaneous key presses (Figure 2 and column 5, lines 1-15. The examiner interprets that again since each sensor has its own lead 48, that when multiple keys are pressed there is an overall force produced from the presses but since each sensor has its own lead, the force for each key would be correctly output for each key pressed, therefore the total force felt is divided among the keys pressed.).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claims 2, 4, are rejected under 35 U.S.C. 103(a) as being unpatentable over Sellers (US 5,995,026) in view of Houston (US 2002/0154038).

Regarding claim 2, Sellers discloses the computer keyboard of claim 1.

Sellers fails to teach of a computer keyboard further comprising a grid of conductors located on the frame and forming a plurality of intersections, each intersection including a pair of conductors from the grid, wherein: each key of the plurality is located over a corresponding intersection and causes an electrical connection between the two conductors of the corresponding intersection when the key is pressed, and the microprocessor is in electrical communication with the conductors.

Houston discloses a computer keyboard (Figure 5, item 100) comprising a grid of conductors located on the frame and forming a plurality of intersections (Figure 5, item 500), each intersection including a pair of conductors from the grid (Figure 5, items C1-Cn and R1-Rn), wherein:

each key of the plurality is located over a corresponding intersection (Figure 5, item 502 and paragraph [0021]. The examiner interprets that since the capacitive

element, which is at the intersection of the conductors, is associated with a key that the key is located over the intersection.) and

causes an electrical connection between the two conductors of the corresponding intersection when the key is pressed (Paragraphs [0021]-[0022]. The examiner interprets that since the strobe pulse is sent through the column conductors and when the key is depressed the row conductor is energized by the strobe pulse that this occurs when the key presses the two conductors together causing an electrical connection.), and

a controller in electrical communication with the conductors (Figure 5, item 504. The examiner interprets that the controller is in electrical connection with the conductors since it detects when the keys are pressed.).

Therefore it would have been obvious to "one of ordinary skill" in the art at the time the invention was made to use the conductor method of detecting the key pressing taught by Houston with the computer keyboard taught by Sellers such that the pressing of the key would cause the force sensor to sense a force and cause an electrical connection of the conductors in order to provide a keyboard which can be easily reconfigured to accommodate the handicaps of a specific user.

Regarding claim 4, Sellers discloses the computer keyboard of claim 1, wherein the force sensor comprises a force-sensitive resistor material (Figure 2, item 44 is an FSR switch.).

Sellers fails to teach of a computer keyboard comprising an upper and a lower conductor with a force sensor located between the upper and lower conductors.

Houston discloses of a computer keyboard comprising an upper and a lower conductor with a force sensor located between the upper and lower conductors (Figure 5 and paragraphs [0021]-[0022]. Items R1-Rn and C1-Cn are upper and lower conductors and the capacitive device located at the intersection 502 between the conductors is a force sensor since it detects when a key is pressed and force must be put on a key in order to depress it.).

Therefore it would have been obvious to "one of ordinary skill" in the art at the time the invention was made to use the conductor method of detecting the key pressing taught by Houston with the computer keyboard taught by Sellers such that the pressing of the key would cause the force sensor to sense a force and cause an electrical connection of the conductors in order to provide a keyboard which can be easily reconfigured to accommodate the handicaps of a specific user.

Regarding claim 11, please refer to the rejection of claims 1 and 2. Sellers also discloses a computer keyboard comprising:

a base (Figure 2, item 42);

a plurality of force sensors located between the base and the frame (Figure 2, sensors 44 are located between the frame 30 and the base 42.); and

a microprocessor (Figure 2, item 52):

coupled to the force sensors so as to receive force data output from the force sensors (Figure 2, microprocessor 52 is coupled to the force sensors 44 by leads 48.).

Houston also discloses a computer keyboard having a controller with a plurality of conductor pins each in electrical contact with one of the conductors of the grid (Figure 5 and paragraphs [0022]-[0023]. The examiner interprets that since the controller receives signals from the conductors that the conductors are connected to the controller.).

6. Claims 5-6 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sellers (US 5,995,026) in view of Houston (US 2002/0154038) and further in view of Muurinen (US 6,504,492).

Regarding claim 5, Sellers and Houston disclose the computer keyboard of claim 4. Sellers also discloses wherein the microprocessor is configured to:

individually test each key of the plurality to detect if said key is pressed by a user (Figure 2 and column 5, lines 1-15. The examiner interprets that allowing no signal to be received at the microprocessor end when the switches are open, i.e. no key has been pressed, is the microprocessor testing the keys individually via the leads 48.), and measure an output of the force sensor (Figure 2, X and column 5, lines 1-15).

Sellers and Houston fail to teach of a computer keyboard wherein a microprocessor is configured to:

permit, upon detecting a pressed key, a voltage to pass to ground through the force sensor, and

measure, subsequent to permitting said voltage to pass to ground through the force sensor, an output of the force sensor.

Muurinen discloses of a computer keyboard which permits, upon detecting a pressed key, a voltage to pass to ground through a resistor, and measures, subsequent to permitting said voltage to pass to ground through the resistor, an output of the resistor (Figure 2 and column 1, line 44 to column 2, line 11. The examiner interprets that when the key is pressed that the current path produced is permitting the voltage from the voltage source to flow to ground, and that since the voltage rail assumes a voltage value caused by the key press and an output signal is generated that this is measuring the output of the resistor after the voltage passes through the resistor and to ground.).

Therefore it would have been obvious to "one of ordinary skill" in the art at the time the invention was made to use the resistance measuring method taught by Muurinen with the computer keyboard taught by the combination of Sellers and Houston such that the microprocessor would measure the value of the force sensing resistor after the voltage passes through ground in order to allow for less electromagnetic interference and less power dissipation during operation.

Regarding claim 6, Sellers, Houston and Muurinen disclose the computer keyboard of claim 5. Muurinen also discloses a computer device further comprising an

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Analog to Digital Converter (ADC) coupled to the resistor and configured to convert a resistor voltage level to a digital value (Column 2, lines 6-11).

Regarding claim 12, this claim is rejected under the same rationale as claim 6.

7. Claims 7-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sellers (US 5,995,026).

Regarding claim 7, Sellers discloses the computer keyboard of claim 1.

Sellers fails to teach wherein the plurality of keys includes multiple character keys having respective characters associated thereto and a plurality of modifier keys.

However, it would have been obvious to “one of ordinary skill” in the art at the time the invention was made to include characters on the keys and have modifier keys since it is well known in the art that keyboards have letters and numbers printed on the keys to identify keys from one another and also have modifier keys such as the Shift, Ctrl and Alt keys to modify the existing keys to perform other functions.

Regarding claim 8, Sellers discloses the computer keyboard of claim 7.

Sellers fails to teach wherein the plurality of keys includes at least 36 character keys.

However, it would have been obvious to “one of ordinary skill” in the art at the time the invention was made to include at least 36 character keys since there are 26

letters in the alphabet and 10 number keys are needed, having numbers 0-9, to create any number, thus making the total number of keys needed to be at least 36.

8. Claims 13-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sellers (US 5,995,026) in view of Houston (US 2002/0154038) and further in view of Muurinen (US 6,504,492) and Olodort et al. (US 6,563,434).

Regarding claim 13, Sellers, Houston and Muurinen disclose the computer keyboard of claim 12.

Sellers, Houston and Muurinen fail to teach of a computer keyboard wherein a microprocessor is configured to:

ground a pin in electrical contact with a first conductor,
test a pin in electrical contact with a second conductor for a voltage level indicative of a press of the key associated with the intersection of the first and second conductors, and

upon detecting the voltage level indicating a press of the associated key, read from the ADC data generated by the press of the associated key.

Olodort et al. disclose of a computer keyboard wherein a microcontroller is configured to:

ground a pin in electrical contact with a first conductor (Figure 40 and column 18, lines 32-51. The examiner interprets that since it is detected which bus is connected to ground that there is a capability for the bus, or pin, to be grounded.),

test a pin in electrical contact with a second conductor for a voltage level indicative of a press of the key (Figure 40 and column 18, lines 32-51. The examiner interprets that determining which bus is connected to ground or to positive current is testing for a key press.), and

upon detecting the voltage level indicating a press of the associated key, read from the ADC data generated by the press of the associated key (Figure 40 and column 18, lines 32-51. The examiner interprets that after scanning the conductors, since the analog to digital converter makes the value available to the microcontroller that this would detect which key is pressed and read the data.).

Regarding claim 14, this claim is rejected under the same rationale as claim 4.

Regarding claim 15, this claim is rejected under the same rationale as claim 9.

Regarding claim 16, this claim is rejected under the same rationale as claim 7.

Regarding claim 17, this claim is rejected under the same rationale as claim 8.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Monney et al. (US 6,758,615) disclose of a key sensing device for providing two levels of sensing depending on force applied to the keys.

Armstrong (US 6,559,831) discloses of sensors with circuitry for reading the varying value from the sensor and causing representative varying of the imagery shown by the display.

Armstrong (US 6,563,415) discloses of an analog sensor capable of varying an analog output of the sensor responsive to varying force applied.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen G. Sherman whose telephone number is (571) 272-2941. The examiner can normally be reached on M-F, 8:00 a.m. - 4:30 p.m..


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Edouard can be reached on (571) 272-7603. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SS

26 January 2006



PATRICK N. EDOUARD
SUPERVISORY PATENT EXAMINER